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Averting a Sino-U.S. Space Race

When China successfully launched its fourth and final test flight of an unmanned spacecraft on December 30, 2002, the country's leaders hailed this accomplishment as a major technological triumph. Senior officials of the People's Republic of China (PRC) predicted that the manned space program would launch China's first astronaut (*yuhangyuan*) in late 2003. The Chinese media predictably brimmed with national pride, while some international media questioned whether such a prestige project was a waste of resources. More generally, international attention to China's space program has been sporadic and patronizing at best, either denigrating it or treating it nonchalantly, predominantly because it has come so late.

This prevailing indifference, however, risks overlooking the longer-term consequences of China's growing space power and, more dangerously, the potential collision of U.S. and Chinese interests in space. From China's perspective, the United States' self-appointed guardianship of space is presumptuous and represents a genuine challenge to China's national security concerns. For the United States, China's extension into space symbolizes its ambitions to challenge U.S. national security. Deeply seated, mutual suspicions are evident in both countries' strategic assessments as the contours of potential strategic competition between Washington and Beijing emerge. In essence, both sides agree that the other represents a challenge. Although this potential clash of interests is not yet sufficiently severe to be visible to casual observers, the United States and China are on the threshold of a space race that could radically influence international security.

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U.S. Interests in Space

Conventional wisdom holds that space is so vital to national security and economic prosperity that the United States will do whatever it takes to protect its ability to use space. This rationale was enshrined in an influential report issued in January 2001 by a blue-ribbon commission on space,[1] headed by Donald Rumsfeld before he became secretary of defense, which strongly advocated greater protection for U.S. space assets. The Rumsfeld Commission asserted that "[t]he security and economic well being of the United States and its allies and friends depend on the nation's ability to operate successfully in space. To be able to contribute to peace and stability in a distinctly different but still dangerous and complex global environment, the [United States] needs to remain at the forefront in space, technologically and operationally, as we have in the air, on land and at sea."[2] Furthermore, the report argued that "the present extent of U.S. dependence on space, the rapid pace at which this dependence is increasing, and the vulnerabilities it creates, all demand that U.S. national security space interests be recognized as a top national security priority."[3]

In economic terms, the United States relies on space technologies and capabilities to support a wide range of commercial activities. Among the most important commercial assets in space is the constellation of Global Positioning System (GPS) navigation satellites. The precise timing signals emitted from the GPS allow automobiles, aircraft, and ships to locate their positions and establish the chronological order for virtually all financial transactions. Indeed, the global financial network would collapse without GPS. Equally important, commercial satellites carry most global communications. Despite the phenomenal growth rate of fiber optics networks, commercial satellites still dominate long-haul global communications.

The United States is extraordinarily dependent on space for its national security.[4] The U.S. military has integrated space technologies into virtually all aspects of military operations, dramatically improving U.S. military power. Since the 1991 Persian Gulf War, which is widely considered the first "space war," the Pentagon has relied on electro-optical, hyperspectral, infrared, and radar satellites to see what is happening on the battlefield.[5] Communication satellites allow military commanders to be connected to their forces, while the navigation signal from GPS satellites is essential for precision attacks. The air campaigns over Kosovo, Afghanistan, and Iraq also demonstrated the value of space assets in modern warfare.

Similarly, U.S. military commanders increasingly rely on imagery from commercially owned satellites; in fact, commercial satellites handled 80 percent of U.S. military communications during the Kosovo operation in 1999.[6]

Government agencies often pay private firms to collect and process vital satellite imagery. For the first five months of the Afghan campaign, the Department of Defense paid the Space Imaging Corporation $1.9 million per month for images of Afghanistan collected by its *Ikonos* imaging satellite. This new commercial satellite market also creates vulnerabilities because of the ability of hostile governments or terrorist organizations to gain access to readily available satellite imagery. Such information could be used to harm U.S. interests in various ways, including attacking military bases and disrupting military operations.

The United States and China are on the threshold of a space race.

In sum, because U.S. military effectiveness and commercial competitiveness depend so overwhelmingly on space, the country is increasingly vulnerable to an adversary's malicious use of space or attacks against space systems. As the Rumsfeld Commission report warned ominously, "If the [United States] is to avoid a 'space Pearl Harbor,' it needs to take seriously the possibility of an attack on U.S. space systems. The nation's leaders must assure that the vulnerability of the United States is reduced and that the consequences of a surprise attack on U.S. space assets are limited in their effects."[7] At present, most nations cannot challenge the United States directly, but there are fears that states might someday attack U.S. satellites to cripple its military capabilities. Policymakers in the United States are increasingly concerned that this is precisely China's strategy.

Chinese Interests in Space

As with the United States, China's objectives in space reflect broad commercial and military interests. From an economic perspective, the PRC views the exploitation of space as an integral part of its modernization drive, a top priority on Beijing's national agenda.[8] The rapid growth of China's economy in the past two decades has fueled investments in civilian space capabilities for several reasons. First, the explosive growth of the Chinese telecommunications market has spurred China to put both indigenous and foreign-made networks of communications satellites into orbit to keep pace with demand. Second, China's relatively inexpensive and increasingly reliable launchers have enabled Beijing to provide satellite-launching services to major international customers. Third, China recognizes that space research at the frontier of scientific knowledge promises innovative breakthroughs that are likely to strengthen its economic power and technological capabilities in the long term.

As a result of these economic imperatives, the Chinese government has invested substantial resources in a robust space program. The PRC has developed a comprehensive scientific and industrial base capable of producing commercial space launchers and satellites. Chinese launch vehicles, which have become increasingly reliable and competitive in the international market, can place a variety of satellites—including those used for communications, remote sensing, photo reconnaissance, meteorology, and scientific research—into earth orbit. Furthermore, since 1999, China's involvement in preparations for manned space flight has attracted substantial international attention.

The global financial network would collapse without GPS.

In the case of national security, China's space program is shrouded in extreme secrecy, effectively shielding Chinese intentions and capabilities from outside observers. The PRC's official policy is to support the exploitation of space for economic, scientific, and cultural benefits while firmly opposing any militarization of space.[9] China has consistently warned that any testing, deployment, and use of space-based weapons will undermine global security and lead to a destabilizing arms race in space.[10] These public pronouncements have been primarily directed at the United States, especially after President George W. Bush declared in December 2001 that the United States was officially withdrawing from the Anti-Ballistic Missile Treaty and accelerating U.S. efforts to develop a missile defense system.

Some Chinese observers point to U.S. efforts to militarize space as evidence of the U.S. ambition to establish unilateral hegemony. For example, in 2001, Ye Zhenzhen, a correspondent for a major daily newspaper of the Chinese Communist Party, stated that, "[a]fter the Cold War, even though the United States already possessed the sole strategic advantage over the entire planet, and held most advanced space technology and the most satellites, they still want to bring outer space totally under their own armed control to facilitate their smooth ascension as the world hegemon of the 21st century."[11] Diplomatically, China has urged the use of multilateral and bilateral legal instruments to regulate space activities, and Beijing and Moscow jointly oppose the development of space weapons or the militarization of space.[12]

The Chinese leadership's opposition to weaponizing space provides evidence of China's growing concern that the United States will dominate space. The United States' avowed intention to ensure unrivaled superiority in space, as exemplified by the Rumsfeld Commission report, increasingly defines China's interests in space. Chinese anxieties about U.S. space power began with the 1991 Gulf War, when the PRC leadership watched with awe

and dismay as the United States defeated Iraq with astonishing speed. Beijing recognized that the lopsided U.S. victory was based on superior command and control, intelligence, and communications systems, which relied heavily on satellite networks. Demonstrations of the United States' undisputed conventional military power in Bosnia; Kosovo; Afghanistan; and, most recently, Iraq further highlighted for Chinese officials the value of information superiority and space dominance in modern warfare.

China's obsession with national prestige, which forms the backdrop for its commercial and military interests, also animates the country's space policy.[13] The PRC government has long boasted about its status as one of the few major space-faring nations. Indeed, its manned space program has been driven largely by the desire to become the third nation, after the United States and the former Soviet Union, to launch humans into space. Success in China's manned space program will confer a strong sense of national dignity and international status on the country, which are viewed as crucial elements to sustain the legitimacy of the Communist Party and replace its declining ideological appeal. This intangible yet powerful expression of Chinese nationalism partially explains why Beijing invests substantial national resources into its space program.[14]

Sources of Competition

At the same time that the United States views space dominance as a fundamental tenet of its national security, China evidently views U.S. space dominance as a major threat to its geostrategic interests. These views inevitably breed a zero-sum competition, in which one side perceives any loss as a gain for the other, and could ultimately prove destabilizing for Sino-U.S. relations.

First, Beijing perceives the proposed U.S. missile defense system, which will be supported by an array of space systems and sensors, as a strategic menace to China and to international security.[15] Many China watchers contend that this perception stems from anxieties that any conceivable system of missile defenses being developed by the Bush administration will undermine China's small nuclear deterrent.[16] Beijing remains wary of the joint research program on missile defense by the U.S.-Japanese alliance, which the PRC sees as a potential partnership for blocking Chinese regional aspirations or, in broader terms, for containing China. Of particular concern for Beijing is the possibility that Tokyo's decision formally to join U.S. plans for deploying missile defense in Northeast Asia will significantly increase Japan's military capabilities by providing an opportunity for Japanese forces to enjoy unprecedented military integration with U.S. forces in the areas of space-based intelligence and communications.

Second, the military use of space has profound implications for the uneasy stalemate in the Taiwan Strait, which has always presented the possibility of a major confrontation between Washington and Beijing. One argument is that U.S. capabilities allow the United States to project power near Taiwan, while the space-based sensors and weapons for missile defense could blunt China's arsenal of ballistic missiles aimed at Taiwan. Moreover, the prospect of transfers of missile defense systems to Taiwan, which could usher in a period of unprecedented military cooperation between Taipei and Washington, no doubt deeply troubles Beijing. China, for its part, will increasingly need military space capabilities if it is to improve its ability to coerce Taiwan in a conflict and counter U.S. intervention to defend the island in a crisis or conflict.

The U.S. views space dominance as a fundamental tenet of its national security…

A final argument is that, even though recent Chinese efforts to curtail the transfer of technologies related to weapons of mass destruction (WMD) have progressed (albeit haltingly), proliferation remains a key point of contention in Sino-U.S. relations. Indeed, China played a key role in the status of Pakistan's nuclear capabilities as well as in North Korea's development of long-range Taepo-dong missiles. Recent revelations about Islamabad's nuclear assistance to Pyongyang in exchange for missile technology suggest that many roads lead to Beijing when it comes to WMD proliferation in the region. In May 2003, the Bush administration imposed sanctions on a major, state-owned Chinese firm for allegedly assisting Iran's ballistic missile program.[17] The technologies behind Beijing's proliferation of ballistic missile technologies are highly relevant to the development of China's space power.

These differing bilateral perspectives on space and security are contributing to the growing perception in both capitals that the other poses a significant military and strategic threat in space. The prevailing assessments in Beijing and Washington are notable for their unmistakable apprehension of each other. For example, annual Pentagon reviews of China's military, which began in 1998, have produced an ominous picture of PRC space capabilities.[18] Even while conceding that China's technologies lag far behind those of the West, these reports argue that the exploitation of space is beginning to dominate Chinese military strategy. They also assert that the PRC has established key military programs for the specific purpose of denying the United States its use of space. For example, China is reportedly developing a high-energy laser that could temporarily dazzle or permanently blind the sensors on imaging satellites. Department of Defense assessments have also

concluded that, by 2010, China will have indigenously developed advanced space technologies as well as imaging and communications satellites. Of particular concern and the subject of intense scrutiny by the Pentagon is China's interest in developing antisatellite capabilities that would prevent the United States from using military and commercial satellites.[19]

A congressionally mandated bipartisan commission, which annually reviews security ties between the United States and China, concurs with the Pentagon's conclusions.[20] The U.S.-China Security Review Commission noted that China will need space-based reconnaissance to precisely target its new generation of ballistic missiles, land-attack cruise missiles, and antiship cruise missiles. The latter would be of decisive importance in military operations against U.S. aircraft carriers in the Taiwan Strait. Arguing that China was devising strategies to counter U.S. space-based warfare, the Rumsfeld Commission also identified a conflict in the Taiwan Strait as a threat to U.S. space systems. China could, for example, preemptively attack U.S. assets in space prior to the outbreak of conflict in the Taiwan Strait in an effort to prevent the United States from coordinating military intervention. China could also disrupt commercial satellites upon which everyday American life depends in the hopes of dampening U.S. political will to intervene.[21]

...China views U.S. space dominance as a major threat to its geostrategic interests.

Chinese officials and commentators have drawn similar conclusions about the United States. In a rather blunt article published in a Hong Kong–based newspaper, which reportedly enjoys close ties with the Chinese military establishment, Chinese analyst Gao Yan, argued that, because space power determines a nation's destiny, it is imperative for China to pursue military capabilities in space aggressively. He warned that, because of fundamental differences in ideology, national interests, geopolitics, and military strategies, the PRC must be prepared for the imminent strategic rivalry with the United States.[22]

In remarks apparently made in response to a U.S. military space exercise conducted in early 2001 in Colorado Springs, in which China was the presumptive enemy, Teng Jianqun, the chief editor of China's *World Military Review* and a member of China's Military Science Academy, echoed similar sentiments. He stated that, "[w]hen any country [in this case, the United States] is preparing a military confrontation with China in outer space, we have to pay close attention and prepare for what would happen."[23] Furthermore, the director of the China Aerospace Corporation's Science and Tech-

nology Committee, Zhuang Fengan, has argued that a major aim of China's space program is to develop advanced weapons for space warfare.[24] Zhuang indicated that key areas for further development include reliability, precision strike ability, and stealth.

During the next decade or so, the PRC will not likely be able to compete in every area of space technology with the United States at any level that even remotely resembles the intensity of the superpower rivalry during the Cold War. In addition, with the Bush administration's defense transformation plans, U.S. investments in the next generation of leap-ahead technologies are likely to leave China even further behind. Over the next 5–10 years, however, Beijing may be able to pursue selective technological capabilities that can challenge U.S. interests in space.

The military use of space has profound implications for the Taiwan Strait.

The fact that 95 percent of space technologies are dual-use in nature could both accelerate and conceal progress in China's space program.[25] For example, advances in China's commercial launchers are likely to improve the range, accuracy, and payload of intercontinental ballistic missiles. As economic reforms accelerate, indigenous sources of innovation in civilian technologies could migrate into China's military and space programs. Similarly, international ventures involving the transfer of technology and skills to China will likely find their way into military programs. Furthermore, the blurry—if existent—divisions between civil and military institutions in the Chinese space program make it easy to transfer technologies from the civilian sector to military programs.

In any event, China does not need to reach parity with the United States to harm U.S. interests in space. Some China scholars have argued that China could use a range of old and new technologies, including advanced space capabilities, to weaken the political will of superior adversaries who increasingly depend on space to fight wars.[26] Whether this approach will be successful is debatable, but U.S. vulnerabilities to disruptions in space might embolden China to attack U.S. space systems in the event of a military confrontation over Taiwan.

Strategists in the United States and in China are clearly monitoring the other's developments in space. How the United States judges Chinese intentions and capabilities will determine Washington's response; of course, the reverse is equally true. As each side eyes the other, the potential for mutual misperceptions can have serious and destabilizing consequences in the long term. In particular, both countries' exaggerated views of each other could lead unnecessarily to competitive action-reaction cycles.

What exactly does such an action-reaction cycle mean? What would a bilateral space race look like? Hypothetically, in the next 10 years, some critical sectors of China's economy and military could become increasingly vulnerable to disruptions in space. During this same period, Sino-U.S. relations may not improve appreciably, and the Taiwan question could remain unresolved. If Washington and Beijing could increasingly hold each other's space infrastructure hostage by threatening to use military options in times of crisis, then potentially risky paths to preemption could emerge in the policy planning processes in both capitals. In preparing for a major contingency in the Taiwan Strait, both the United States and China might be compelled to plan for a disabling, blinding attack on the other's space systems before the onset of hostilities. The most troubling dimension to this scenario is that some elements of preemption (already evident in U.S. global doctrine) could become a permanent feature of U.S. and Chinese strategies in space. Indeed, Chinese strategic writings today suggest that the leadership in Beijing believes that preemption is the rational way to prevent future U.S. military intervention.

If leaders in Beijing and Washington were to position themselves to preempt each other, then the two sides would enter an era of mutual hostility, one that might include destabilizing, hair-trigger defense postures in space where both sides stand ready to launch a first strike on a moment's notice. One scenario involves the use of weapons, such as lasers or jammers, which seek to blind sensors on imaging satellites or disable satellites that provide warning of missile launches. Imagine, for example, Washington's reaction if China disabled U.S. missile warning satellites or vice versa. In that case, Sino-U.S. relations would be highly vulnerable to the misinterpretations and miscalculations that could lead to a conflict in space. Although attacks against space assets would likely be a precursor or a complement to a broader crisis or conflict, and although conflicts in the space theater may not generate many casualties or massive physical destruction, the economic costs of conflict in space alone for both sides, and for the international community, would be extraordinary given that many states depend on satellites for their economic well-being.

Limits to Cooperation

Perhaps it is too soon to conclude that Beijing and Washington are locked on a path toward a military space race. Because of the potential for such competition, however, it is in both their interests to consider opportunities for cooperation that would ensure that the space infrastructure remains a public good for the international community. One option could be to de-

velop a series of measures to establish transparency in an effort to bolster mutual confidence, thus decreasing the likelihood of competition in space. The incentives for establishing transparency that could lead to further Sino-U.S. cooperation in space remain so woefully limited, however, that it may be years before these conditions could prevail.

The term "transparency" basically refers to a condition of openness that allows states to signal their intentions and capabilities by obtaining or exchanging information on items or activities that are of interest to the parties involved. Transparency permits states to increase their confidence about whether an activity is taking place and, more importantly, provides early warning of suspicious behavior. Although the term is generally associated with arms control, the concept of transparency has broader applications, such as preserving openness in global financial transactions.

In practical terms, transparency requires several key steps, including military-to-military contacts and broader exchanges (between weapons labs, for example) of information on defense budgets, doctrine, plans and operations, decisionmaking processes, acquisition, and research and development programs. In its most intrusive form, transparency involves full accounting of a declared activity or a commitment to a treaty regime. The purpose of mutually understood declaratory policies and doctrines is to spell out the rules of the game and thus those actions that could lead to confrontation. The goal is to enable each state to engage in reciprocal and observable activities that signal a commitment to enforcing predictable rules of behavior in times of peace and of crisis as part of a strategy to avoid the miscalculation that could lead to war.

Transparency requires both sides to be ready to take measures that permit them to exchange sensitive information and to share perceptions about the risks and threats that could undermine international security. During the Cold War, the superpowers realized that they could inflict extraordinary harm on each other with nuclear weapons, and they experienced several near misses, such as the Cuban missile crisis. In that climate, both sides gradually came to understand that transparency, which was often pursued through arms control measures, could improve their security.

Today, however, no such degree of animosity exists between the United States and China; nor is it clear that Washington or Beijing believes that it confronts a common problem in space, which demands mutual collaboration. Ironically, the absence of prolonged, severe tensions and the ambiguity that continues to surround the future of bilateral ties have obscured the potential dangers of competition in space. This lack of urgency partly explains why there is still no consensus in Washington on whether to constrain or expand U.S. military activities in space.

Even if Beijing and Washington were to engage in measures designed to build transparency into their space programs, the tremendous disparity in their technological capabilities creates another serious impediment to sharing information. The United States is so far ahead in almost every technological sense that Washington has relatively little, if anything, to learn from China's last generation of space technologies, whereas the PRC would benefit enormously from recent U.S. technological innovations. In the face of overwhelming U.S. technological superiority, China has few bargaining chips to offer.

China does not need to reach parity with the United States to harm U.S. interests in space.

Equally problematic is the fact that both Washington and Beijing cloak their space programs in extraordinary levels of secrecy. Each side probably believes that maintaining great uncertainty in the minds of potential adversaries enhances their security. China shields its space program from scrutiny to hide its relatively inferior position; the United States does so to maintain its technological lead. This culture of secrecy creates an impediment to enhancing mutual understanding about the other's intentions.

A dominant feature in Chinese policy has been Beijing's traditional reticence to reveal its intentions on matters of national security and military capabilities. Moreover, China's reluctance to reveal just how technologically backward and militarily weak it actually is reinforces this secretive tendency. Successive generations of defense White Papers have repeatedly demonstrated the insular nature of China's security apparatus. Unsurprisingly, U.S. efforts to encourage greater transparency on the part of the Chinese have invariably proved disappointing. For example, the initial curtailment of military-to-military contacts early in the Bush administration reflected U.S. officials' widespread frustration over the lack of Chinese reciprocity. Moreover, the internal opacity of Chinese policymaking casts doubt on the accuracy of the information flowing from China. The disastrous initial cover-up of the SARS outbreak offers clear evidence of this problem.

For all these reasons, Washington and Beijing lack the incentives needed to lead to information exchange. With the possible exceptions of vague unilateral declarations and bilateral exchanges, both sides are not at the stage where they are likely to pursue transparency in their space programs. Furthermore, as long as the United States maintains its technological lead while China accelerates its efforts to achieve some degree of parity in space, the elements of transparency will not exist for some time to come.

Meanwhile, a poisonous atmosphere of distrust continues to prevail as a result of allegations in the past decade that Chinese espionage and illegal transfers of U.S. space technologies strengthened China's military space program. For example, in the mid-1990s, after a series of launch failures, China turned to Loral Systems, a U.S. satellite firm, for technical assistance. Subsequent investigations revealed that Loral had released sensitive technical data to the Chinese that may have helped the PRC improve its missile guidance capabilities. In 1999 a U.S. congressional investigation chaired by Representative Christopher Cox (R-Calif.) concluded that the performance of China's launchers improved as a result of those transfers.[27] In another case, the Department of State recently charged that, in the 1990s, the Boeing Company and Hughes Electronics Corporation violated up to 123 export restrictions related to the transfer of missile and satellite data to China.[28] As a result of these events, lingering suspicions on Capitol Hill will impede efforts to spearhead bilateral cooperation in space and could provoke a congressional backlash against attempts to try.

If these mutual suspicions and disincentives to cooperation persist, Washington and Beijing might be headed on a collision course in space. Therefore, the foreign policy and defense communities should address at least two important questions. First, how will China respond to continued U.S. dominance in space, especially if bilateral ties deteriorate into hostility in the future? In other words, will China devise counterstrategies and invest heavily in space capabilities to blunt or undermine U.S. supremacy in space? Second, under what scenarios or contingencies would China or the United States employ space-based warfare against the other?[29]

Averting a Looming Competition in Space

Given the stakes involved, both sides should seek to avert, or at least to manage, this looming competition. Even if efforts to forestall this rivalry fail, the United States and China should formulate policies that seek to limit the suspicions and fears of each other as well as the risks and costs of any confrontation in space.

Both sides should begin to develop institutions, rules, and procedures that provide a framework for confidence building in space. For example, during the Cold War, the United States and the Soviet Union developed standard operating procedures and arms control regimes to avert confrontation and escalation. To start, Washington and Beijing should at least prepare the way for gradual transparency in space because the absence of knowledge about the other's intentions and actions fuels heightened threat perceptions. It is not too late to pursue several policy initiatives at the highest lev-

els that would allow both sides to understand more fully what the other is doing and how to interpret those actions.

An important first step for both sides is to acknowledge that a potential problem exists and that it requires consideration at the presidential level. Thus, the strategic importance of space should be included as an agenda item at a future summit between Bush and Chinese president Hu Jintao. To be sure, Sino-U.S. presidential summits have sometimes produced symbolic gestures of strategic cooperation rather than substantive progress, such as the 1998 Clinton-Jiang agreement to de-target nuclear weapons. Indeed, concrete agreements or alignments of interests are likely to prove elusive or fleeting in this case as well. At best, the two leaders could simply agree to disagree for the time being.

> It may be years before incentives for cooperation in space could prevail.

Nevertheless, even a limited discussion at a broader bilateral summit would energize policymakers to focus their attention on the increasingly important problem of a potential confrontation in space. The two leaders could jointly authorize further talks among civilian and military officials on strategic and practical matters related to space, with the objectives being to sustain a regular dialogue, foster realistic expectations about one another, and tailor policies consistent with changing strategic and technological realities.

On the international stage, the United States should encourage Chinese participation in the International Space Station (ISS). Because China's manned space program is primarily based on Russian designs and technologies, it can easily be made compatible and interoperable with the ISS, which relies on many Russian components. This international venture could also tap into China's less costly and increasingly reliable launching services. Moreover, the *Challenger* space shuttle tragedy (and the May 2003 landing of the Russian *Soyuz* capsule that had been missing for several hours) has painfully underscored the need to have redundant capabilities for launching humans into space. Thus, involvement of China's manned space program makes sense for the future of the ISS as well. More broadly, giving China a stake in this global endeavor would reinforce the value of cooperation in space for international security while satisfying Beijing's quest for national pride.

Finally, Washington and Beijing should pursue discussions within a broader regional framework that involves China's more important and technologically capable neighbors. The United States, China, Russia, the European Union, and Japan could regularly cohost a multilateral forum for high-level ministerial meetings that include aspiring space powers such as India, South

Korea, and Malaysia. In addition to high-level political discussions, these regional delegations could engage further in military-to-military deliberations and scientific exchanges on space. Some of these conferences could be arranged as part of unofficial dialogues offering each side an opportunity to discuss shared concerns and interests more candidly. The overall purposes of such efforts would be to highlight the overlapping interests among the major players in space and to emphasize the interdependencies that make conflict in space unacceptably costly and unthinkable for every nation.

Is it possible to have cooperation in space without transparency?

More specifically, these measures are designed to produce an initially informal—and in the long term, formal—framework on common rules of conduct in space. Many precedents have been set in which cooperative efforts have led to more concrete steps toward enhancing international security. Prominent examples include the U.S.-Soviet accords on arms control; the Trilateral Coordination and Oversight Group that harmonizes U.S., Japanese, and South Korean policies toward North Korea; and the declaration between the Association of Southeast Asian Nations (ASEAN) and China on codes of conduct governing naval activities in the South China Sea. Even if these forums do not lead to official agreements on rules of behavior, the interactive process may open channels of communication that could prove helpful in times of regional crisis.

Detractors may argue that, because the gulf between the two powers is too great, no talk shops will avert the competition. The difficulty of getting the United States to the negotiating table on space with any country must initially be acknowledged. With its tremendous technological lead and overwhelming dependence on satellites for military operations and commerce, U.S. policymakers will ask whether Washington has the most to lose in any efforts to improve transparency. As one military official warned, "We don't want to tell the world what our capabilities and limitations are, because that would help the enemy."[30] True negotiation rests on sides moving toward the middle, not one side bargaining away its advantages. Clearly, the incentives for the United States to maintain technological superiority as a policy priority far outweigh the prospects of an uncertain payoff in the future from confidence building with China.

Nevertheless, the costs of competition are mounting, and the risks are getting steeper in the current atmosphere of mutual suspicion. Indeed, the absence of mutually understood perceptions and capabilities is compelling each government to assume the worst about the other and to respond ac-

cordingly in their planning and behavior. In the language of defense planning, the United States and China are seeking to minimize risk and uncertainty about the other. Thus, it is far more preferable for Washington and Beijing to formulate their assessments in the open than to wander aimlessly in the dark. Whether they will succeed depends on the answers to three interrelated questions that require further exploration.

First, is it possible to have cooperation in space without transparency? This question can be refined in another way: What levels of knowledge do both sides need for cooperation to develop?

Second, can there be true cooperation in space without roughly equal capabilities? In particular, what are the conceivable benefits (and how might they be measured) for the United States to cooperate with China, given that Washington enjoys such a commanding lead in space?

Finally, do the elements of disagreement in the broader U.S.-Chinese strategic relationship, particularly with respect to Taiwan, preclude the possibility of cooperation in space? In other words, is it possible for China to look beyond its dissatisfaction with the status quo?

These questions illustrate the daunting policy challenges that both governments face: bridging deeply embedded asymmetries between the United States and China and building a broader framework so that the incentives to cooperate will prevail over the driving forces behind confrontation.

Notes

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